

On the selection of significant variables in a model for the deteriorating process of facades

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Outline

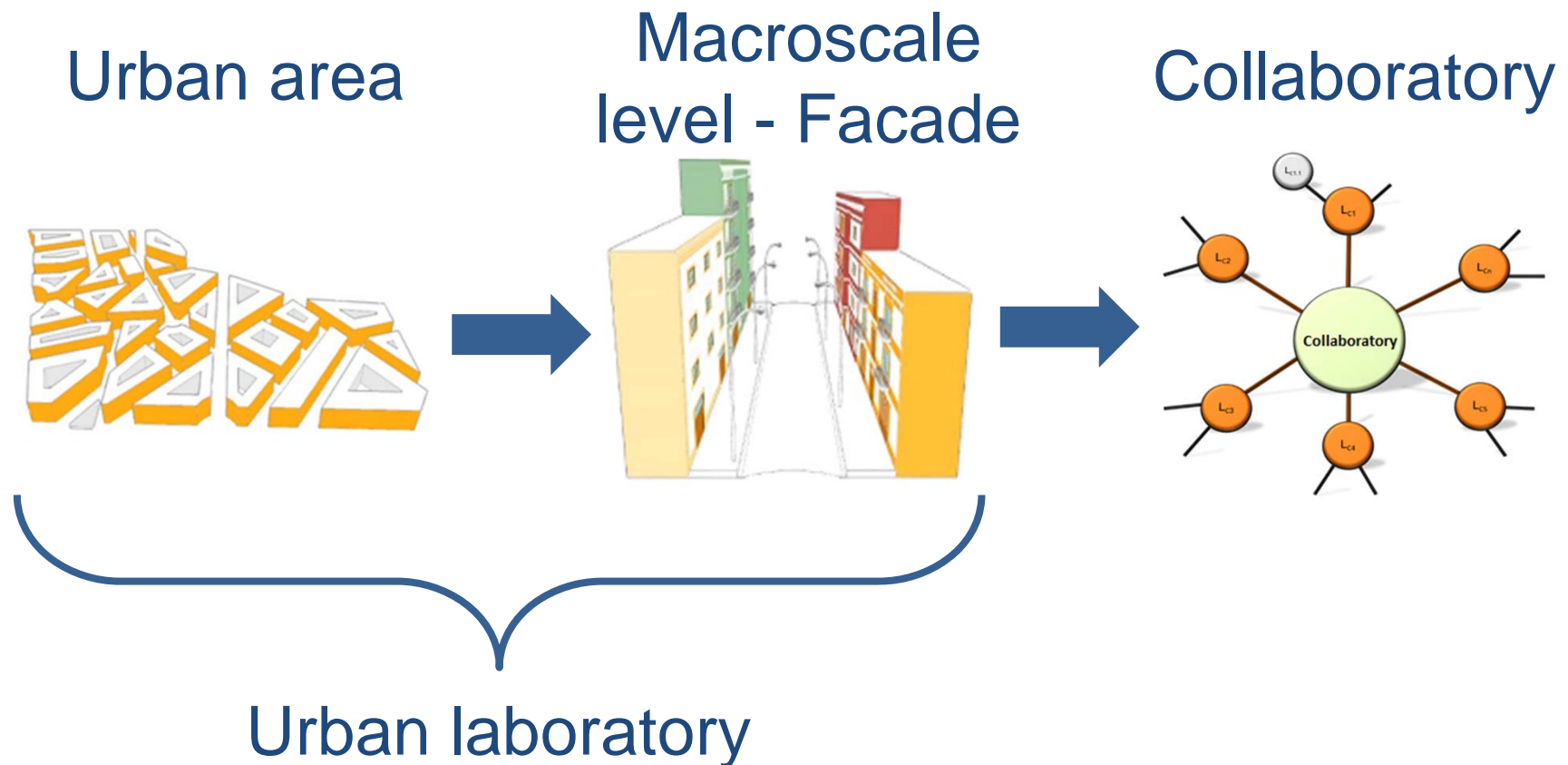
- 1. Introduction and goals**
- 2. BRAIN. A Model Proposal**
- 3. Application and GIS Platform**
- 4. Modeling algorithm**
- 5. Further developments**

1. Introduction and goals

- ✓ The management of the building maintenance is reaching a huge impact around the world.
- ✓ The incorporation of tools to automate the tracking information, follow-up and analysis is needed.
- ✓ Take into account the high cost that the non-maintenance of buildings in appropriate good service conditions represents.
- To develop worldwide monitoring and analysis platforms in order to model and estimate the deterioration process of urban facades.
- To design global and specific maintenance-based policies that allow us to define how to act on the built heritage.

2. BRAIN

2.1 A network of urban laboratories



2.2 Durability goals

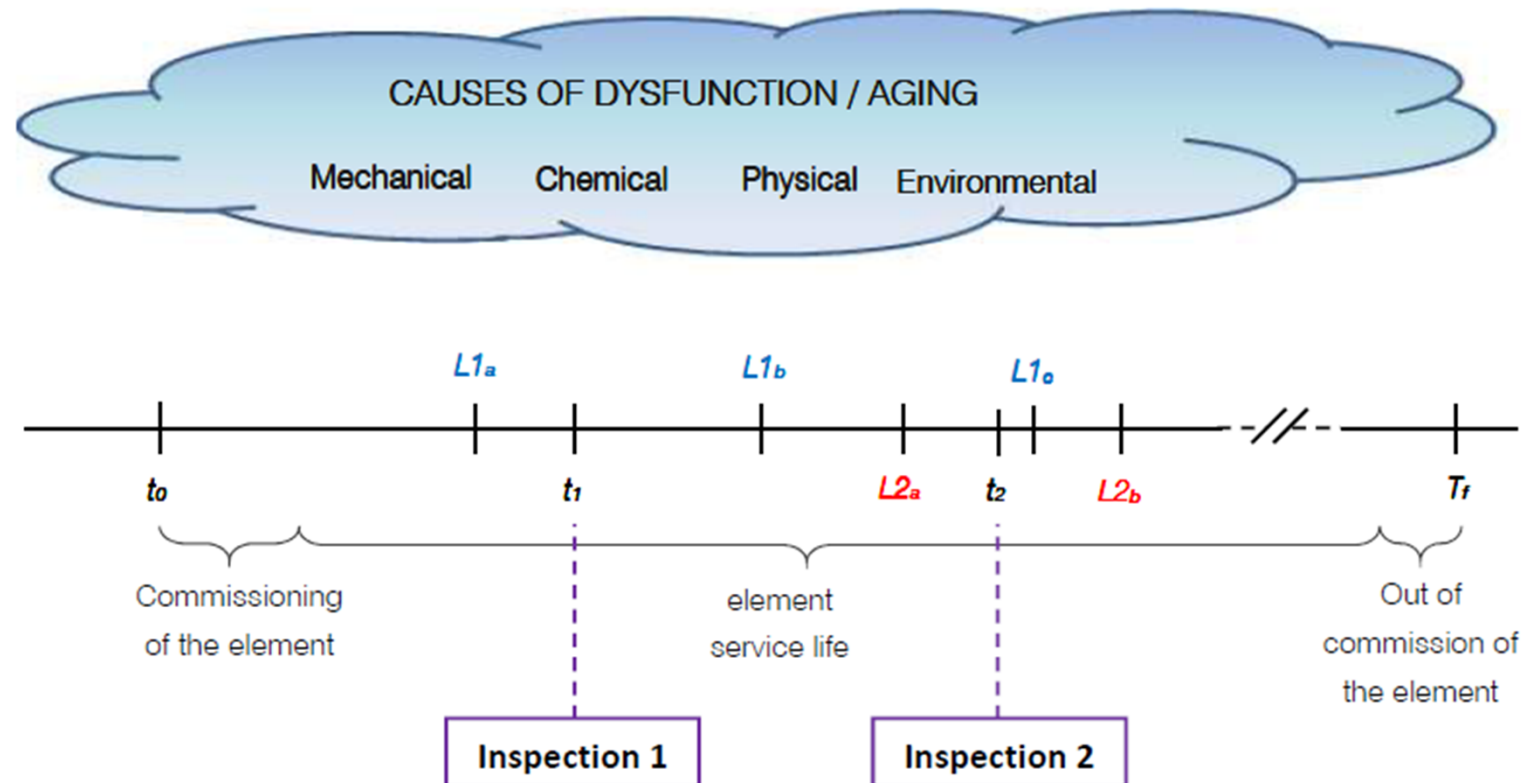
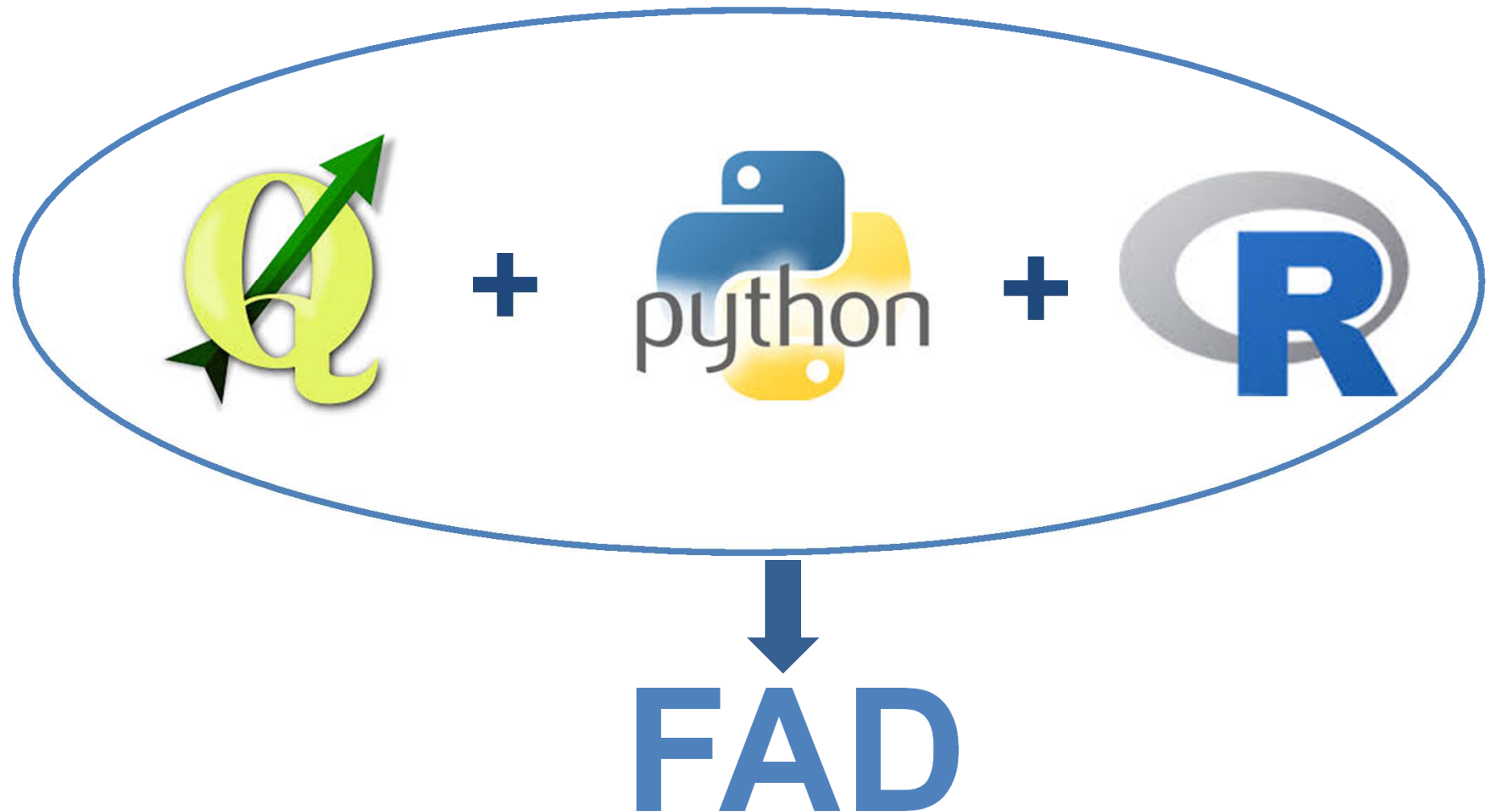
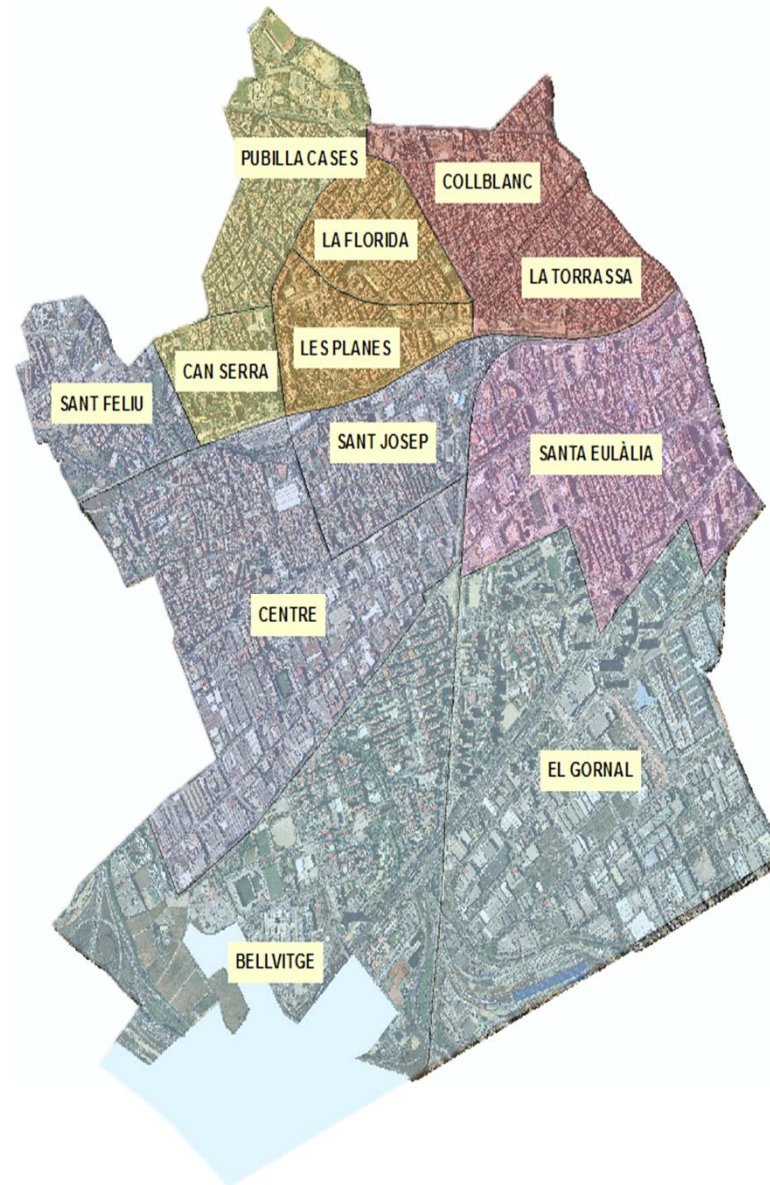


Fig. 1: Illustration of the inspection methodology together with the progression among the different deterioration states along the service life of the facade

Adapted from Serrat and Gibert, 2011

FAD as a programming tools integration





QGIS Desktop


12:26 Carles Serrat

Explorador

- Inicio
- Favoritos
- /
- MSSQL
- PostGIS
- Spatialite
- OWS
- WCS
- WFS
- WMS

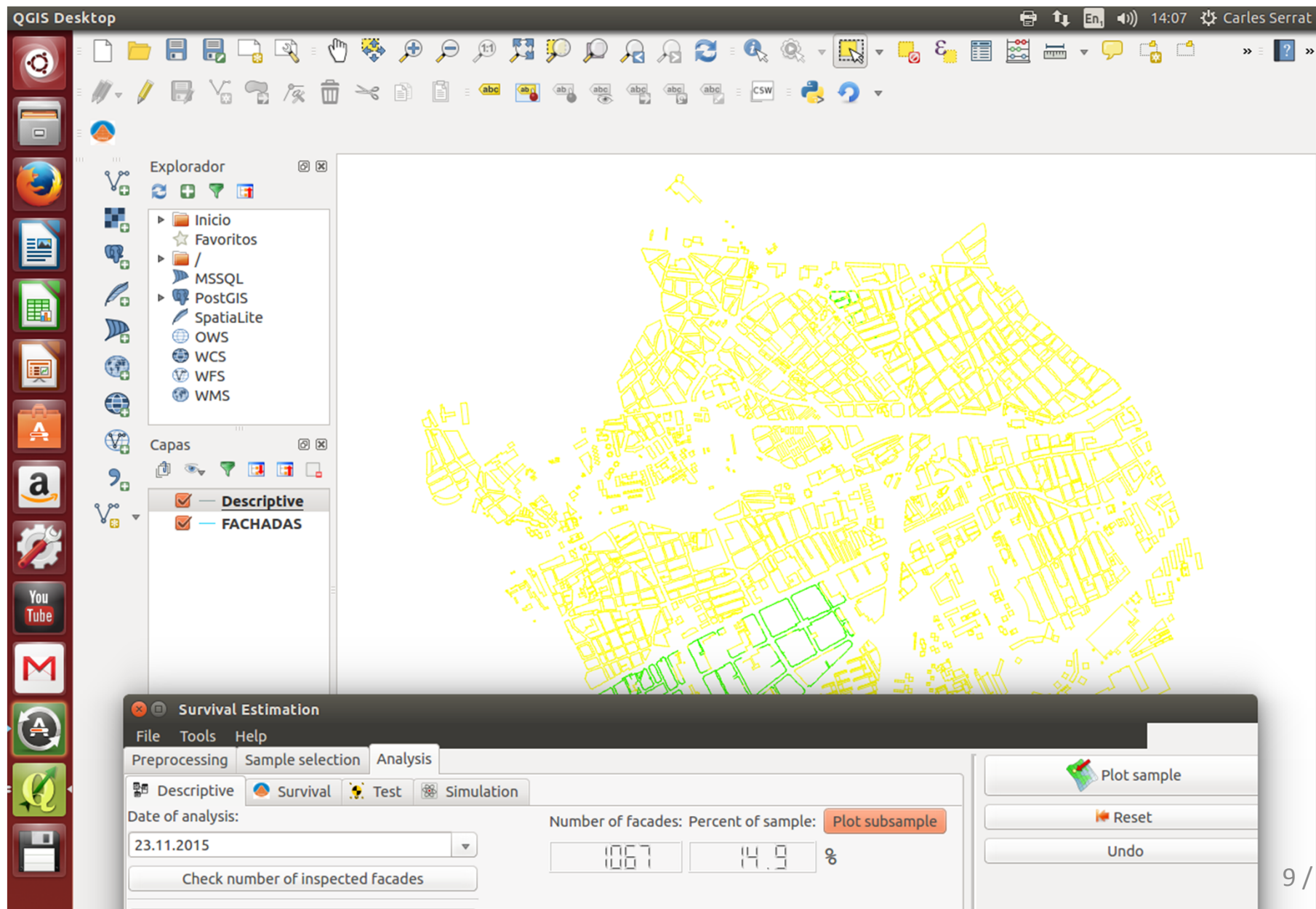
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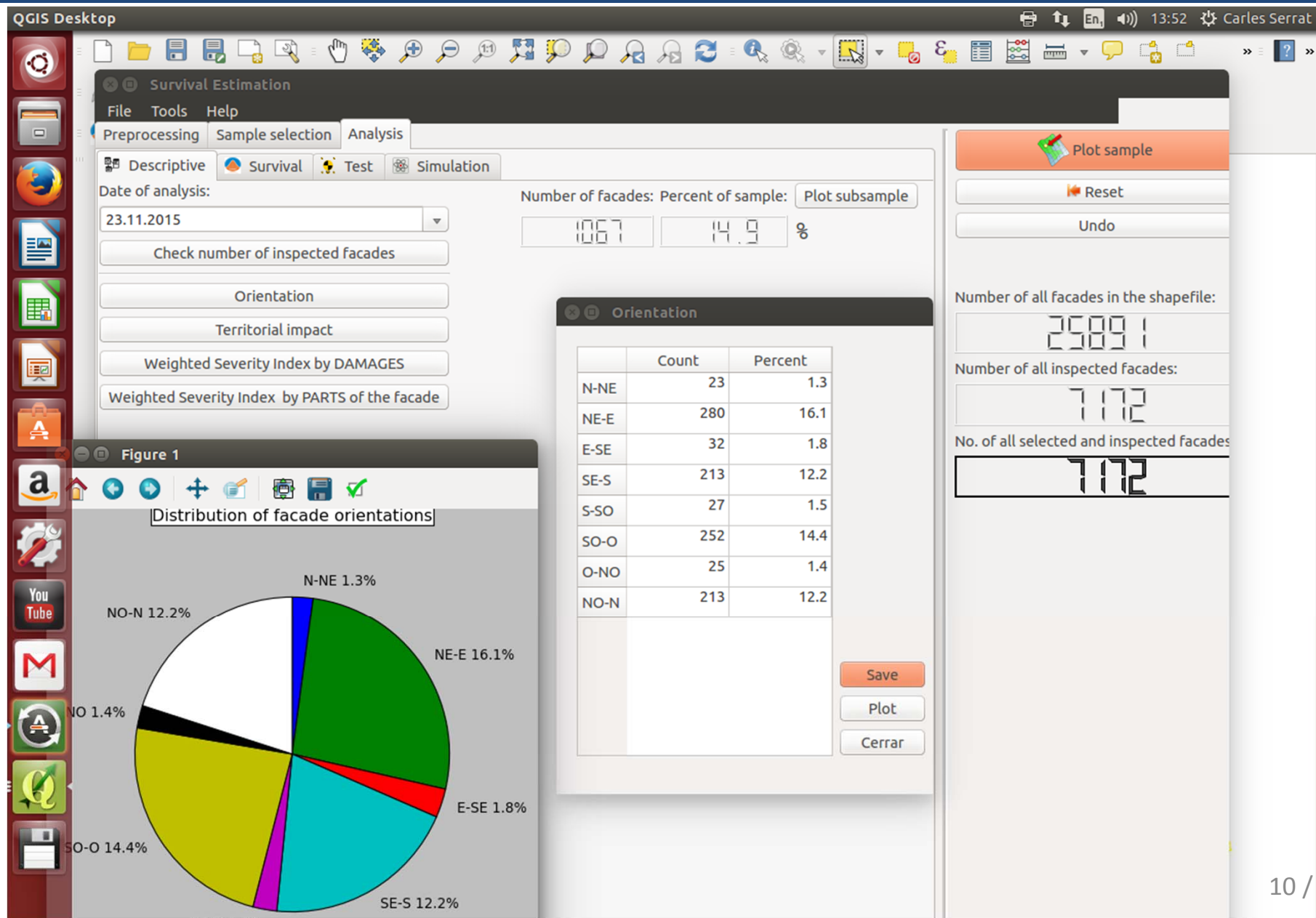
- ☒ FACHADAS

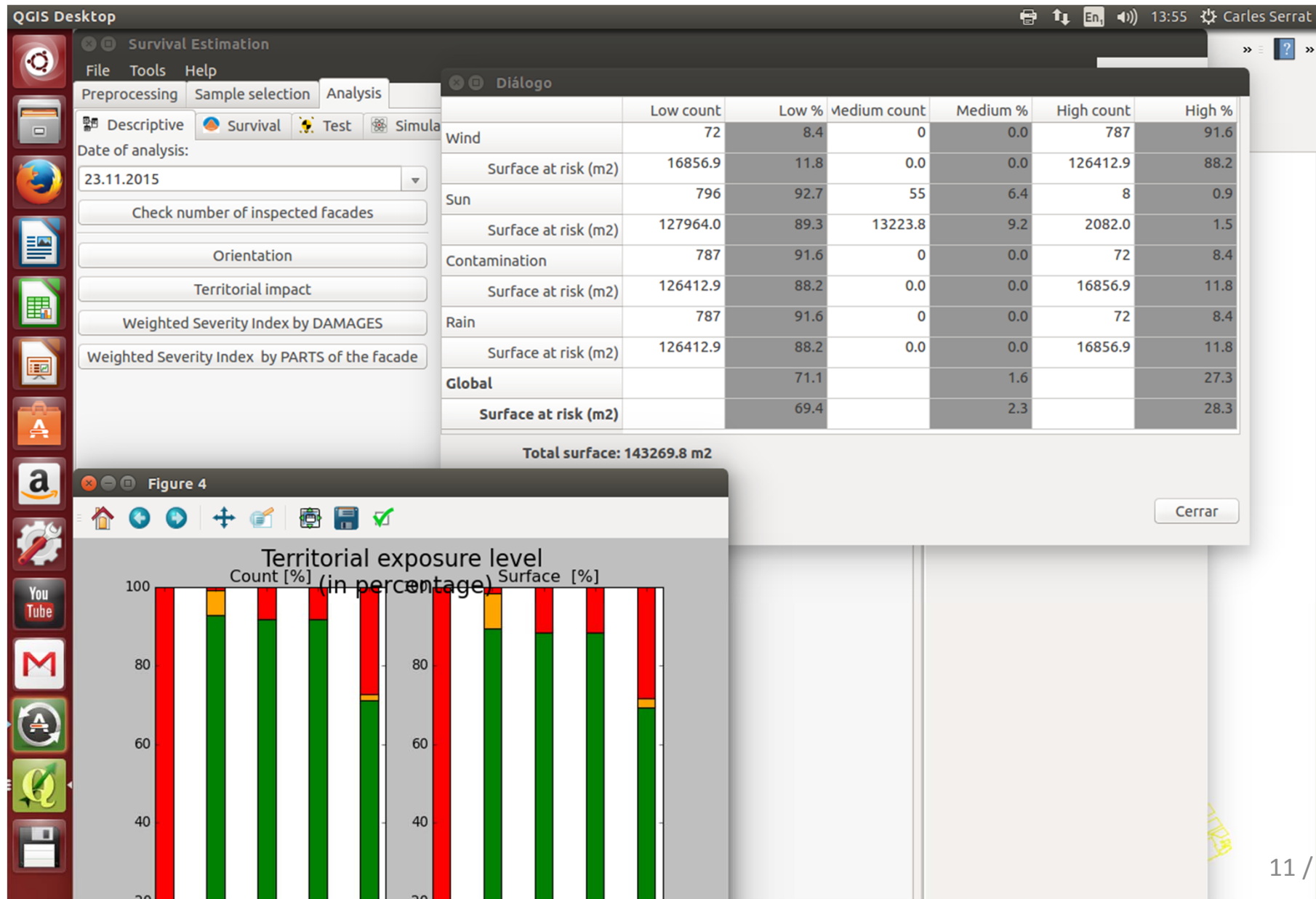


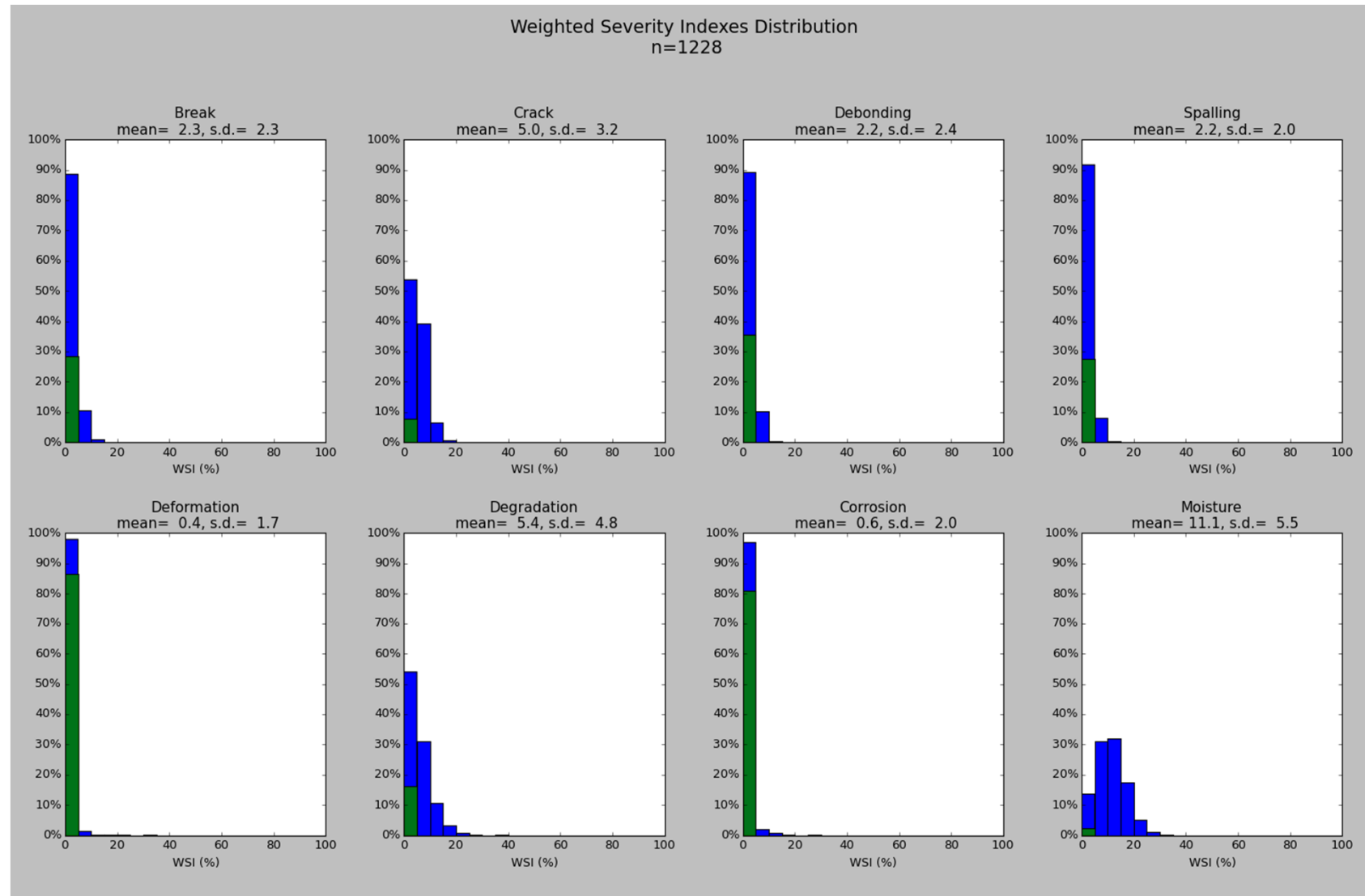
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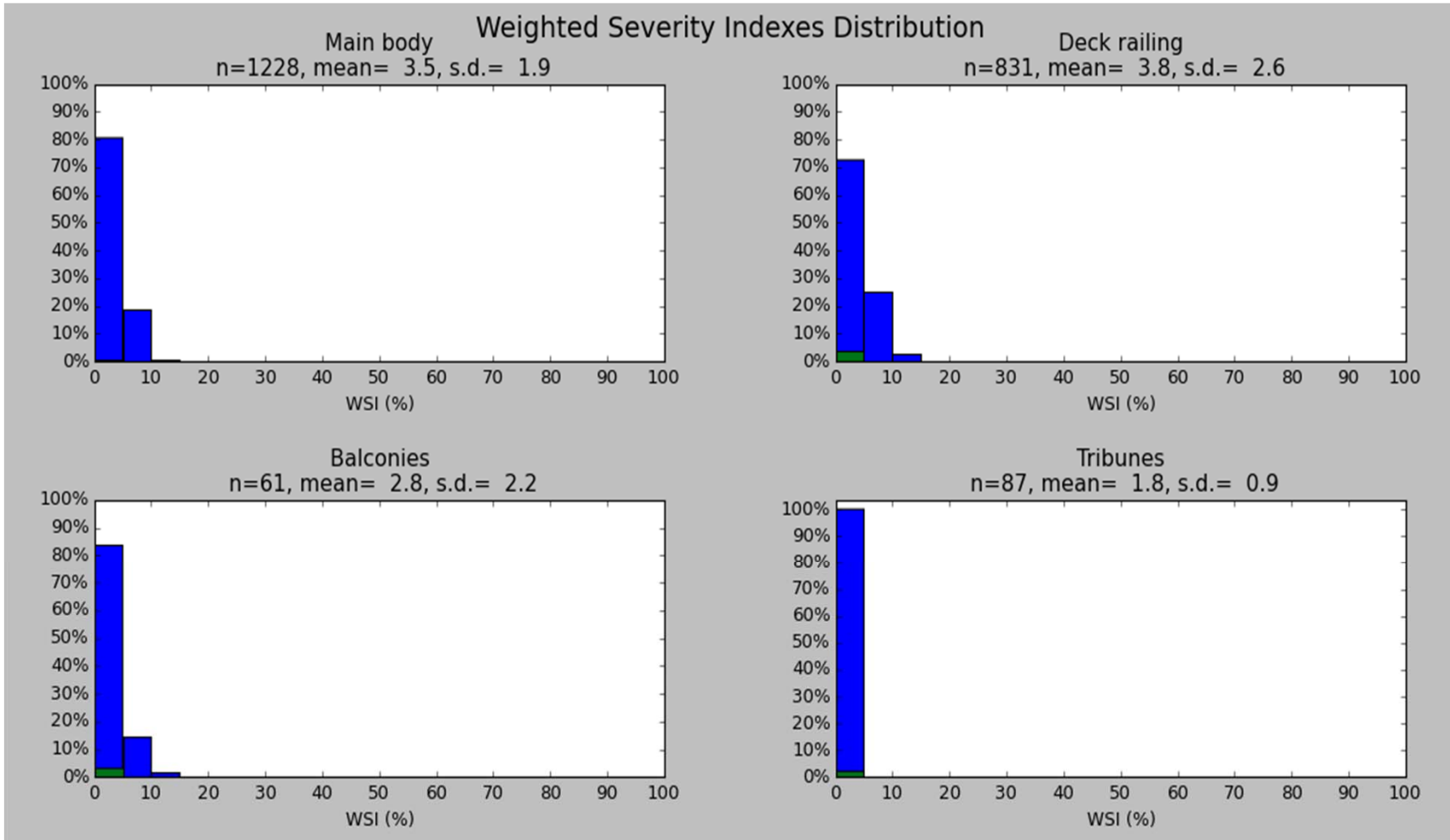
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84	151	5893931DF...	NULL	NULL	NULL	425776.857...	4579147.71...	425737.427...	4579128.96...	39.4300000...	18.7500000...	64.56
85	152	5893931DF...	NULL	NULL	NULL	425789.527...	4579133.36...	425781.647...	4579150.01...	7.87949999...	-16.650000...	-25.3
86	153	5893931DF...	NULL	NULL	NULL	425795.316...	4579136.12...	425789.527...	4579133.36...	5.78999999...	2.75999999...	64.51
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89	156	5893931DF...	E01	FC01	5893931DF...	425764.246...	4579086.67...	425803.496...	4579105.28...	-39.250000...	-18.609500...	64.63
90	157	5893931DF...	E01	FC01	5893931DF...	425852.868...	4579286.43...	425837.528...	4579278.36...	15.3400000...	7.0700000...	65.25











QGIS Desktop

Survival Estimation

File Tools Help

Preprocessing Sample selection Analysis

Database Territorial Timeline Parcel Building Facade Elements Failure

B1-Main Body WALL_ZB

Type of damage	Extent	Severity
T	Punctual	Symptom
F	Local	Mild
M	General	Severe
D		Very Severe
H		Urgent
O		Immediate
B		
E		

Inverse Inverse Inverse

To buffer

Commit

Plot sample

Reset

Undo (0)

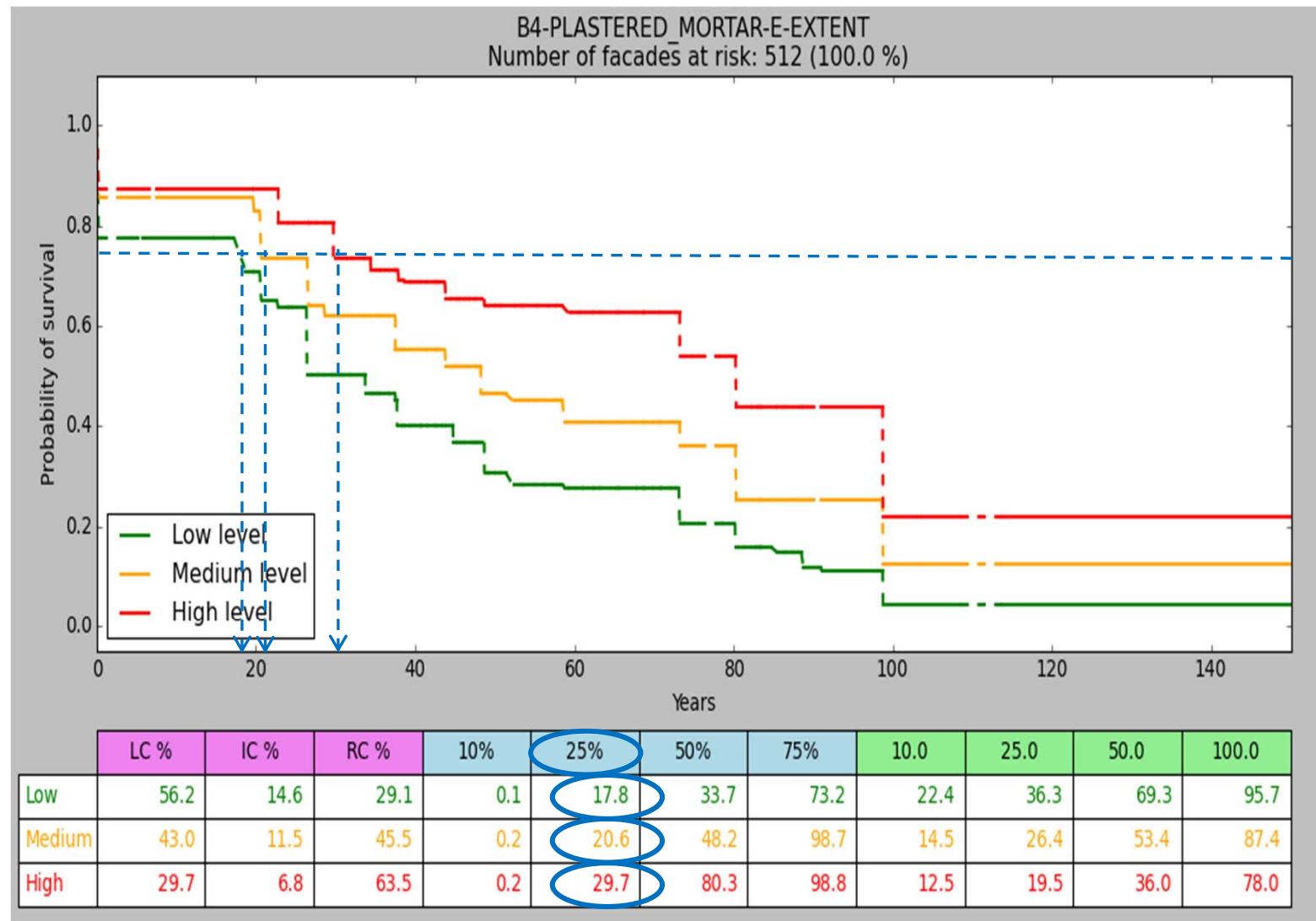
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Number of all inspected facades:
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No. of all selected and inspected facades:
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In buffer: 0

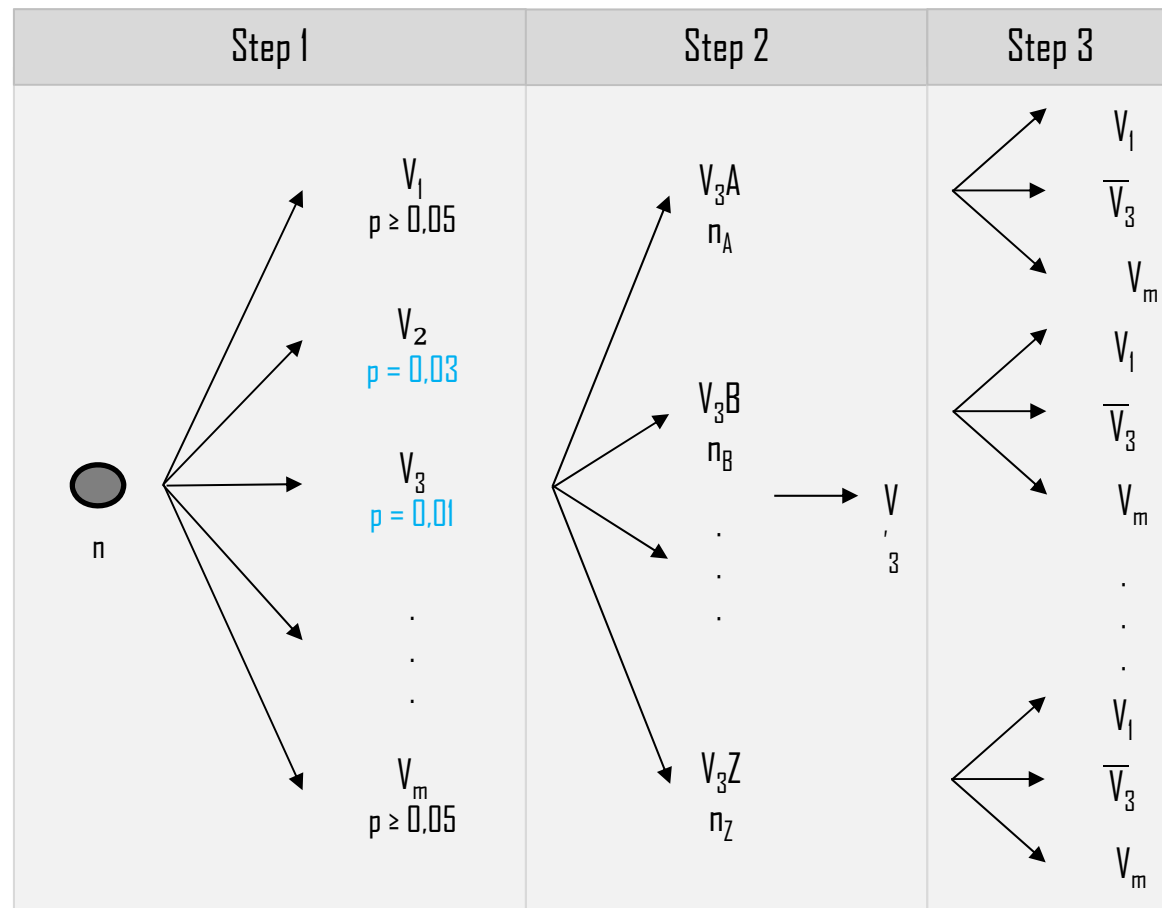
Clear



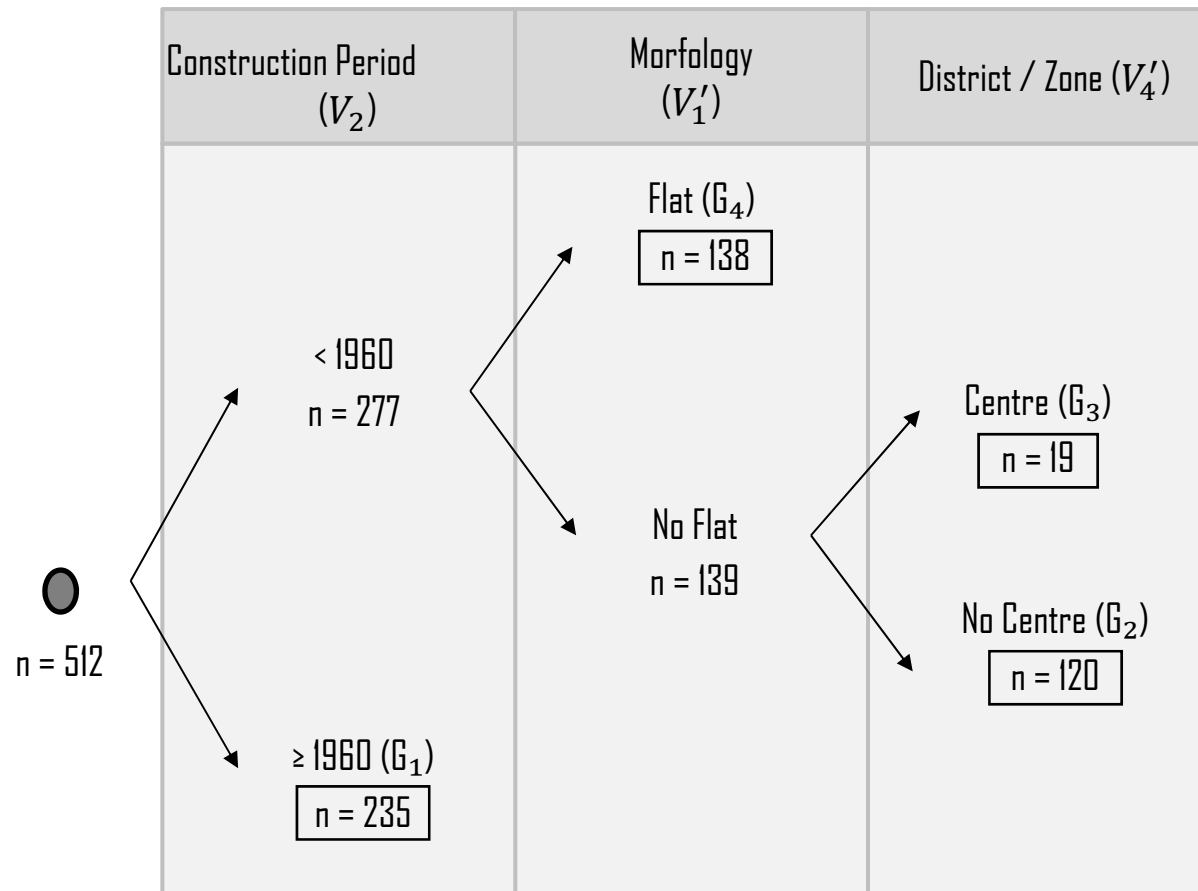
- **Step 2:** Performing a hypothesis test for survival data for each of the m distributions and adjusting the significance level using stepdown procedure valid as long as α values do not exceed the established confidence level.

Oller and
Langohr, 2015

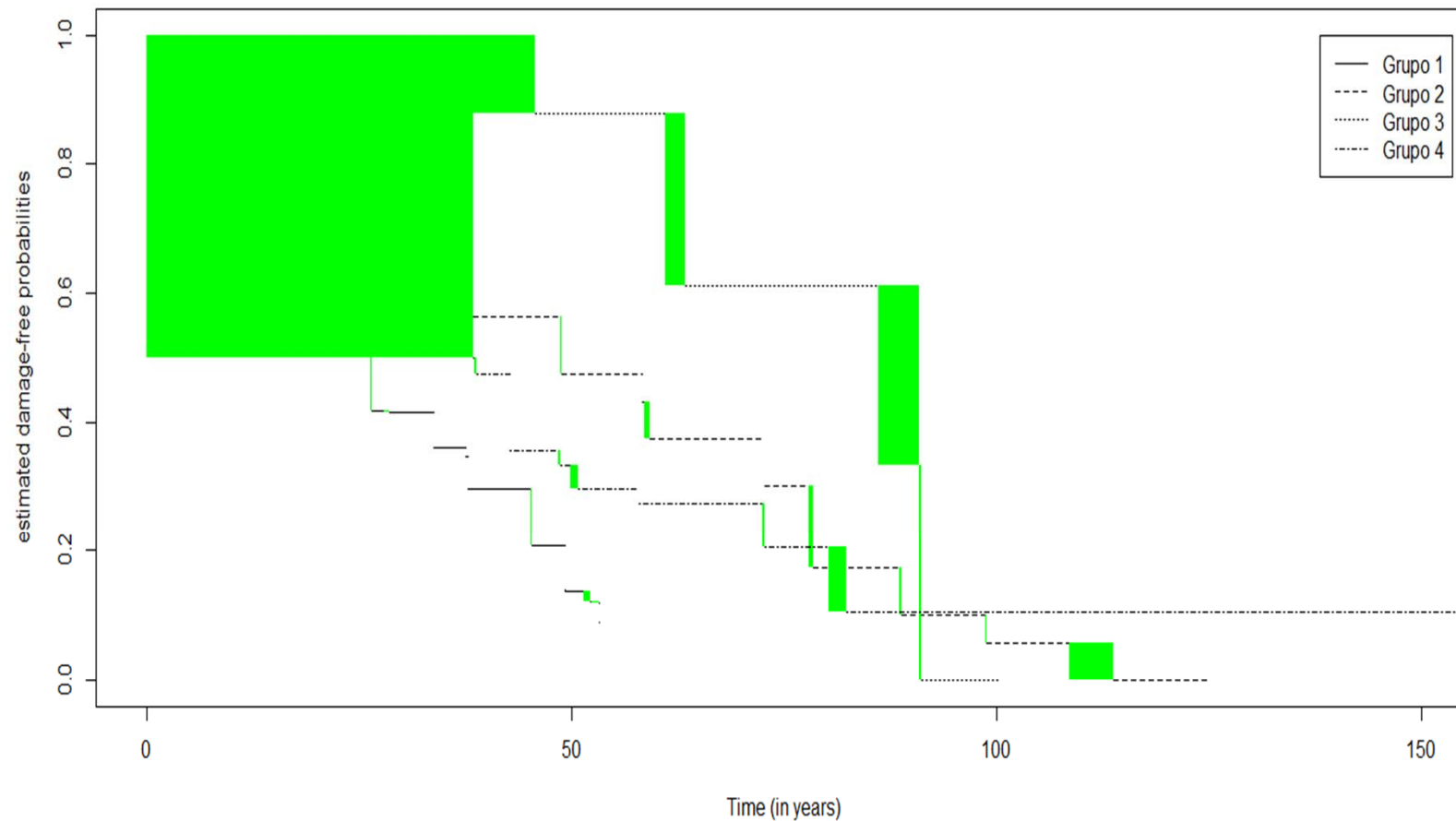
FHtest: Tests
for Right and
Interval-
Censored
Survival Data
Based
on the
Fleming-
Harrington
Class, R
package
version 1.3.



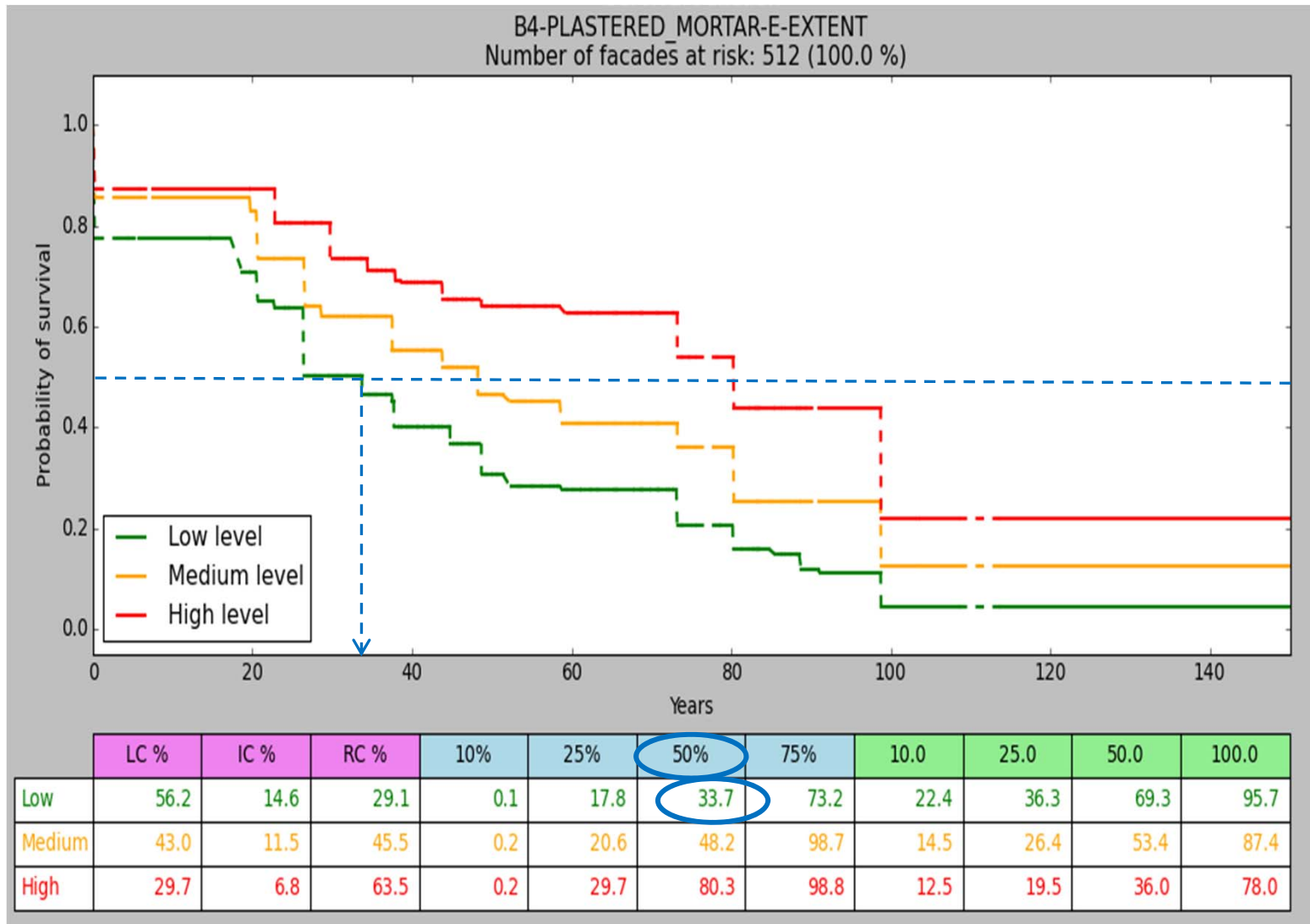
$$T \sim V_2 + V'_1 + V'_4$$



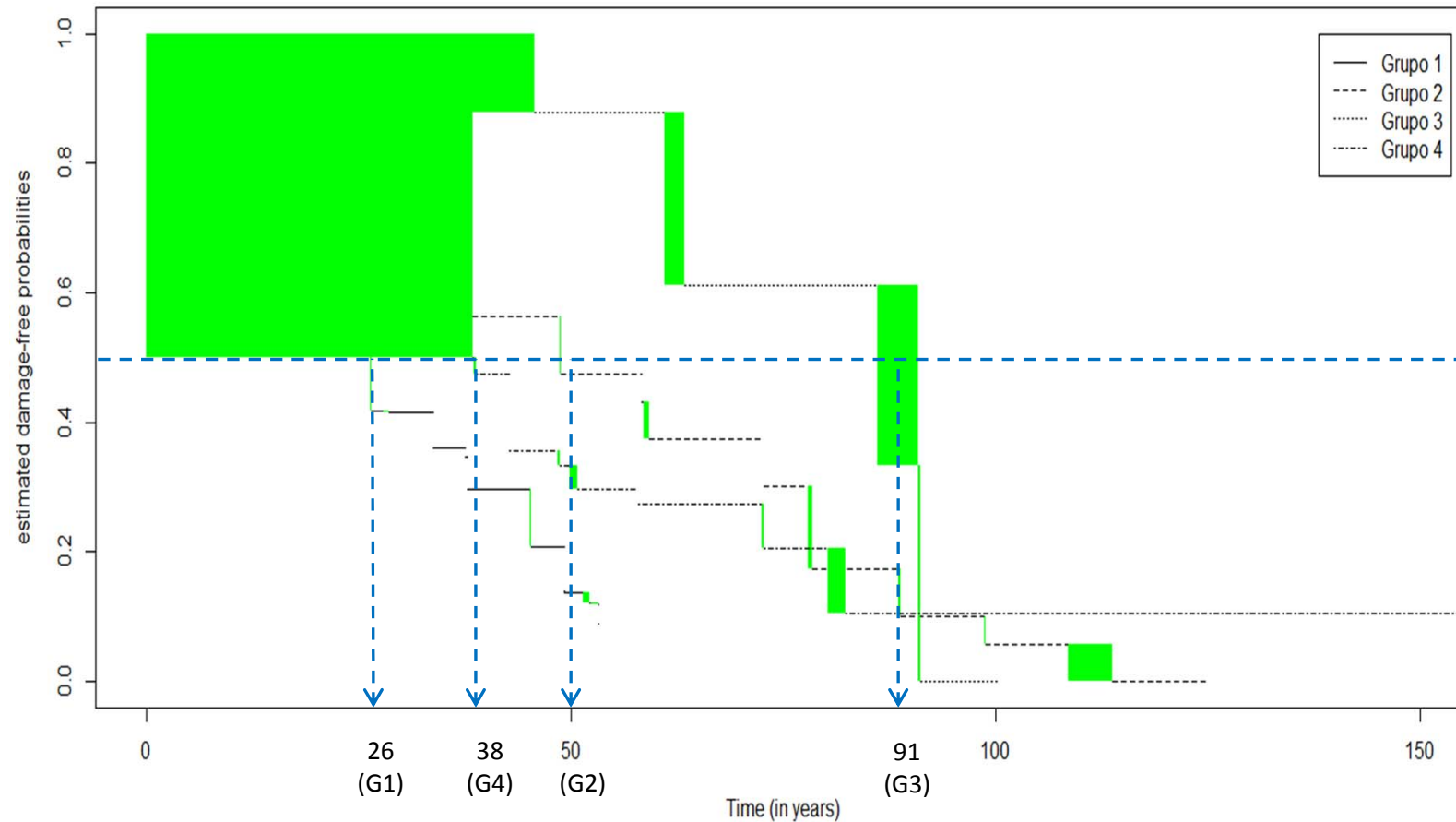
Durability functions by strata



- Estimation of the medians by groups: $G_3 > G_2 > G_4 > G_1$



Durability functions by strata



- Estimation of the medians by groups: $G_3 > G_2 > G_4 > G_1$

5. Forward developments

- Basic training manual for inspectors.
- Improved and more reliable i-pad interface for data collection.
- Photogrammetric inspection and diagnosis.
- Testing and learning in the collaboratory.
- Transitions between-failures modelling.
- Simulation of the urban deterioration process.
- Decision-making modulus.
- EU Standardization of the protocol.

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Liels paldies par jūsu uzmanību



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